

CANCER

Cancer is a group of diseases characterised by abnormal, uncontrolled growth of the cells. Other characteristics of cancer are:

1. The pleomorphism of the cells
2. The presence of aberrations in the nucleus and increased number of mitoses
3. Ability to invade surrounding tissue and in later stages distant organs of the body also.

Problem Statement

World: Cancer is second only to coronary artery disease and is the most common cause of death in the western world. Based on current incidence rates in Europe, it is estimated that one in every three persons will develop cancer at some time during their life.

In developing countries, cancer is the fourth common cause of death. Over the past 25 years, the incidence of lung cancer in men has increased by 125% and even more in females. Cancer accounts for around 50 lakh deaths per year.

India: In India, cancer accounts for 10% of all deaths. The incidence of cancer deaths is around three lakhs per year.

Epidemiology

The etiology of cancer is multifactorial. Some important factors are discussed below:

1. Agent factors

a) Physical agents

- i) Heat
 - Oral cancer (reverse smoking)
 - Khangri cancer
- ii) Solar radiation
 - Basal cell carcinoma
- iii) Ionizing radiation
 - Leukaemia.

b) Chemical agents

- i) Aniline dye
 - Bladder cancer
- ii) Asbestos
 - Pleural mesothelioma
- iii) Benzol
 - Leukaemia
- iv) Nickel and Chromate
 - Lung cancer.

c) Biological agents (Mainly viral)

- i) Hepatitis B virus
 - Hepatocellular carcinoma
- ii) Cytomegalovirus
 - Kaposi sarcoma
- iii) Epstein-Barr virus
 - Burkitt's lymphoma
 - Nasopharyngeal carcinoma
- iv) Human papilloma virus
 - Cancer cervix (suspected)
- v) Human T cell lymphoma virus
 - Human T cell lymphoma

d) Nutritional factors

- i) Smoked fish
 - Cancer of the stomach
- ii) Beef
 - Bowel cancer
- iii) High fat intake
 - Breast cancer
- iv) Dietary fibre
 - Intestinal cancer (suspected)

v) Alcohol

- Oesophageal cancer, liver cancer
(beer is associated with rectal cancer.)

e) **Others**

i) Tobacco

- Cancer of the lung
- Oropharyngeal cancer
- Probably bladder, pancreas, kidney also

ii) Overuse of oestrogen

- Carcinoma uterus

iii) Air pollution and pesticide etc.

2. **Environmental factors**

a) Sunlight—Malignant melanoma

b) Radiation—Radiation cancers

c) Air pollution etc.

3. **Host factors**

- a) **Age:** Cancer is mainly the problem of old age. It is common after 70 years and in children 4–13 years of the age. In India we see cancer among young age groups also, because Indian population is *demographically young*.
- b) **Sex:** Cancer of the cervix and breast cancer is more common among females. Cancer of the lung and prostate cancer is more common among males.
- c) **Occupation:** People who are exposed to chemicals like coal tar, benzene, nickel, asbestos etc are more prone to cancers.
- d) **Genetic factors:** Most neoplastic cells show chromosomal defects.
 - i) Myelogenous leukaemia—defect in long arm of chromosomes 9 and 22.
 - ii) Mongols are more likely to develop leukaemia.
 - iii) Retinoblastoma is seen in children of same parents.

Cancer Prevention and Control

One-third of all cancers are preventable.

Primary Prevention (Prevention at precancerous stage)

1. Control of tobacco consumption (20% cancers are associated with smoking).
2. Immunization—use of Hepatitis B vaccine.

3. Improvement of personal hygiene (Ca. cervix, Ca. penis)
4. Food hygiene—Colours in food might be carcinogenic (should be avoided)
5. Control of air pollution. It is by (a) containment, (b) dilution, (c) replacement, (d) legislation.
6. Control of occupational exposure to: radiation, chemicals and coal tar etc.
7. Treatment of precancerous lesions: like warts, cervical tear, chronic cervicitis, chronic gastritis, intestinal polyps, adenoma etc.
8. Control of alcohol consumption.
9. Legislation:
 - a) Related to use of smoking, alcohol, and prevention of food adulteration act.
 - b) Protection from occupational hazards
 - c) Control of air pollution.

c) Control of air pollution.

Health Education

The main aim of health education or cancer education is to make people aware of early signs of cancer and approach the doctors.

The eight warning signs of cancer are:

1. A hard lump in the breast.
2. Change in size and colour of wart or mole.
3. Persistent change in digestive or bowel habits.
4. Persistent cough or hoarseness of voice.
5. Menorrhagia and metrorrhagia.
6. Blood loss from any natural orifice.
7. A swelling or sore that does not get better.
8. Unexplained loss of weight.

So education of cancer includes:

1. Danger signals of cancer.
2. Awareness about the risk of smoking, alcohol consumption, occupational exposure etc.
3. Awareness of available treatment facilities to cancer. The target group for cancer education is:
 - a) At risk population
 - b) School children
 - c) Occupational groups etc.

Secondary Prevention (Early diagnosis and treatment)

For early diagnosis of cancer we should take the following steps.

1. **Simple and cheapest method is maintenance of cancer registers**
 - a) Hospital-based cancer registers
 - b) Population-based cancer registers

2. **Early detection of cancer cases and treatment**

- a) Physical examination: 75% of cancers that occur can be determined by physical examination.
- b) Screening for cancers: is mainly two types—mass screening and high risk screening. Mass screening is costly, so high risk screening is the most feasible method. The main purpose of screening is detection of precancerous condition.

Example

1. Carcinoma cervix is diagnosed in premalignant condition (carcinoma in situ) by pap smear examination.
2. Breast cancer is diagnosed in early stages by:
 - a) Breast self-examination by the patient (BSE)
 - b) Palpation by the physician
 - c) Thermography
 - d) Mammography (most sensitive and specific).
3. Cancer of the lung is diagnosed by:
 - a) Sputum cytology
 - b) Chest radiography.

cancer deaths in India.

National Cancer Registry Programme (NCRP):

For data base of cancer cases, National Cancer Registry Programme (NCRP) was initiated in 1982 by ICMR, which gives a picture of the magnitude and patterns of cancer. There are two types of registries; Population Based Cancer Registry and Hospital Based Cancer Registries, which was started in January 1982. The Population-based registries take the sample population in a geographically defined area while the Hospital-based registries take the data from patients coming to a particular health institution. At present we have 21 Population-based registries and 6 Hospital-based registries all over the country. In 2001, data from all cancer registries and all medical colleges were collated for the “Development of an Atlas of Cancer in India” (www.canceratlas.india.org) to have an idea of patterns of cancers in several other parts of the country, including those not covered under the NCRP.

Evolution of NCCP

- 1975-76** **National Cancer Control Programme was launched with priorities given for equipping the premier cancer hospital/institutions. Central assistance at the rate of Rs.2.50 lakhs was given to each institution for purchase of cobalt machines.**
- 1984-85** **The strategy was revised and stress was laid on primary prevention and early detection of cancer cases.**
- 1990-91** **District Cancer Control Programme was started in selected districts (near the medical college hospitals).**
- 2000-01** **Modified District Cancer Control programme initiated.**
- 2004** **Evaluation of NCCP was done by National Institute of Health & Family Welfare, New Delhi.**
- 2005** **The programme was further revised after evaluation.**